GODDARD tech transfer news

National Aeronautics and Space Administration

Explore. Discover. Understand.

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Awards Bestowed and Partnership Praised at NTR Program

On April 7th, more than 100 Goddard scientists and researchers gathered at the Newton White Mansion in Mitchellville, Maryland to celebrate their achievements in the field of technology transfer. These individuals had submitted New Technology Reports (NTRs or invention disclosures) or otherwise participated in technology transfer during 2004.

In accepting the 2005 Kerley Award, Peter Shirron (Code 552) recalls Dr. James Kerley's "creative genius that he used to benefit not only NASA, but mankind in general."

"New Technology Reporting is the critical first step to technology transfer," said **Nona Cheeks**, chief of Goddard's Office of Technology Transfer (OTT), during her opening remarks. "We are extremely indebted to all of you who have reported your new technology developments."

Director of the Applied Engineering and Technology Directorate **Mike Ryschkewitsch** (Code 500) discussed spin-in partnerships, their value, and how OTT can help researchers form high-impact partnerships. "I was very pleased to learn that NASA Tech Transfer is now a two-way process," commented attendee **Irving Linares** (Code 564). "There is a significant number of ideas and technologies used for medical instruments, for instance, that have been incorporated into now orbiting satellites."

In addition, OTT and the Office of Patent Counsel bestowed several awards, including patent awards and the Kerley Award. Attendees also heard about a successful spin-in partnership (see below).

Patent Awards

Fifteen innovators were given a plaque and cash award for having their technologies patented during 2004. (All issued patents are listed in the "Metrics" section on the last page of every issue of *Goddard Tech Transfer News*.) "I was honored to join many distinguished guests at the breakfast," said **Per Gloersen** (Code 614), who received his plaque from Center Director **Ed Weiler**.

Kerley Award

The Kerley Award is presented annually to a Goddard innovator who demonstrates exceptional commitment to technology transfer. The 2005 recipient was **Peter Shirron** (Code 552) for his work in transferring his adiabatic demagnetization refrigerator (ADR) technology. "This award is special to me because of the respect and admiration I had for Jim Kerley," reflected Dr. Shirron. "I feel honored to have been considered for this award, and I would like to thank the entire Office of Technology Transfer for their support of my work on ADRs over the last few years. Perhaps unique among support groups at the Center, the Tech Transfer folks really act as our advocates, and it is a pleasure to work with such motivated and friendly people."

Spin-in Partnership

D. Barry Coyle (Code 690) was joined by Gregg Switzer of AdvR Inc. in presenting their partnership to improve lasers used in space exploration. Goddard and AdvR have been working together to develop a space-qualified seed laser that is smaller and more efficient, uses fewer components, and costs significantly less than what is currently available. ■

OTT Launches New Web Site

Go to **http://techtransfer.gsfc.nasa.gov** and check out our newly redesigned Web site. On it you'll find extensive information about OTT as well as details about the technology transfer process and how you can participate. And if you meet someone at a conference who might be interested in working with NASA, send them to this site. ■

Spin-In vs. Spin-Out

Spin-in: Partnering with or adapting technologies from industry, academia, or other government labs to address NASA mission needs.

Spin-out: Finding commercial, academic, and other government applications for NASA technologies.

spotlight on spin-in

Pursuing Partnerships for Robotics Sensing/Imaging

As the Headquarters Innovative Partnerships Program (IPP) pursues technology infusion (spin-in), Goddard is leading the charge in the area of sensing and imaging for robotics.

IPP's "Infusion Project" is an effort to systematically find innovative partnerships to advance NASA's goals for space exploration. After analyzing NASA's capabilities and competencies, IPP established teams to pursue partnerships in five areas:

- Sensing and Imaging for Robotics
- Autonomy and Intelligence
- Advanced Materials and Structures
- Energy Conversion, Storage, and Management
- Systems Health Management

Although this is a NASA-wide effort, the work related to sensing and imaging is headed by Goddard.

"We have extensive expertise and experience in these areas as well as a unique opportunity to apply them to the Agency's new *Vision for Space Exploration*," said Goddard's chief technologist **Peter Hughes** (Code 502). "The potential for partnerships leveraging external innovations and contributions is very high."

That potential is tied to the fact that industry—as well as academia and government-funded agencies—has a lot to gain from partnering with NASA. Industry-NASA partnerships are essentially dual-use projects that meet NASA's needs as well as the current and future needs of industry.

"What we're doing now," explained OTT's **Joe Famiglietti**, "is interviewing principal investigators and project managers at Goddard and throughout NASA to try to precisely define what their needs and specific research challenges are."

This information will be used to connect with potential partners at conferences, such as the RoboBusiness conference in May, at upcoming industry briefings, and through other outreach efforts.

If you are interested in partnering with a company, university, or government laboratory to conduct joint research that advances NASA's space exploration or other research goals—in any area—contact OTT contractor **Nannette Stangle-Castor** (nsc@fuentek.com; 919-873-1457). ■

researcher profile

Matthew McGill

Code 613 •
8 years at NASA

Education: B.S. in physics, Alma College; M.S. in atmospheric science, University of Michigan; Ph.D. in atmospheric science, University of Michigan • **Born**: Alma, Michigan

Tell us about your work with OTT. What have you been doing?

I've been disclosing inventions and working with OTT since about 1997. One of the disclosures has been patented, so I worked with OTT and patent counsel in writing the patent application. I applied for and received funding from OTT to pursue additional development of one of my technologies. Then OTT helped me gain visibility for the technology, taking it to conferences either with me or using a display we jointly developed. In fact, that was how OTT found a licensee for my technology.

How have you benefited from this work?

I'm particularly lucky because we were able to get a license in place, so I'll get royalties along with the patent and other awards I've received for my work with OTT. But more important are the opportunities to find innovative uses for NASA technology. When I disclosed a technology specific to our applications in lidar remote sensing, I never imagined that the technology could be used for monitoring drinking water supplies. But OTT and the work they do got me out of the lab and interacting with other technical, creative people, and an innovative company saw an application that never would have occurred to me.

Any advice for your colleagues?

If you have an invention, disclose it to OTT! You just might get a patent or a license out of it. But you won't get either if you don't submit the New Technology Report (NTR). And be prepared to be patient. A license isn't put in place overnight. Sometimes a company needs a lot of time before they're ready to take on your invention. Finally, I can attest that the folks in OTT have been wonderful to work with and always have the inventor's best interests in mind. ■

Three Newly Signed Agreements

The Office of Technology Transfer is proud to announce that it recently signed three agreements for spin-out of Goddard technology and dual-use partnerships (spin-in). "These agreements put us well over our spin-in goal for the year," said OTT chief **Nona Cheeks**. "I'm so pleased that we hit the target so early. I think it's a real benefit for Goddard's innovators as well as NASA as a whole." All three of these partnerships will advance NASA's science and space exploration goals.

technology: **Gear Bearings**

inventor: **John Vranish** (Code 544)

type of agreement: Nonreimbursable Space Act Agreement

date signed: February 23, 2005

partner: Eaton Aerospace

Eaton Aerospace, subcontractor to Lockheed Martin for the development of the Defense Department's F-35, will design, fabricate, and test an actuator that incorporates Goddard's gear bearing technology for use in the state-of-the-art fighter jet. Currently, Eaton's actuator exceeds size and weight specifications, and Goddard's technology is expected to enable the necessary reductions. This work will advance gear bearings' technology readiness level (TRL) and reduce NASA's costs for flight-qualifying the technology. TRL advances also will accelerate the use of gear bearings in NASA's many potential space exploration applications (e.g., robotics, space tools, rovers).

technology: **Hierarchical Segmentation (HSEG) Software**

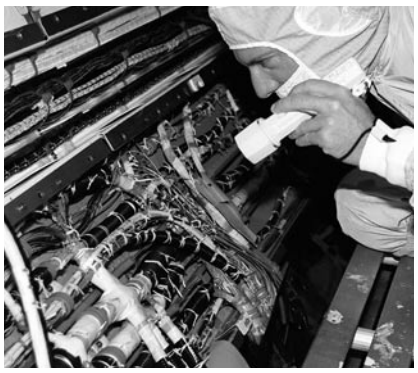
inventor: **James Tilton** (Code 606)

type of agreement: Letter of Agreement

date signed: December 23, 2004

partner: Universidad de Extremadura in Spain (UEX)

Researchers at Goddard and UEX are combining their expertise and respective algorithms to improve hyperspectral imaging. The goal is to develop new algorithms that increase the efficiency of parallel processing of imaging data. Under the agreement, UEX has access to the HSEG algorithms as well as remote access to Goddard's Beowulf PC clusters for parallel processing. Similarly, Goddard has access to UEX's hyperspectral scene data collected over various semiarid areas in Spain. Advances in HSEG will further enhance its applicability to planetary exploration and terrain mapping.



technology: **Hilbert Huang Transform (HHT)**

inventor: **Norden Huang** (Code 614)

type of agreement: Reimbursable SAA

date signed: March 29, 2005

partner: Goodrich Corp.

As part of a project with the Federal Aviation Administration (FAA), Goodrich is working to improve safety of commercial aircraft wiring systems. Under this effort, Goodrich now is studying the applicability of Goddard's HHT technology to inspection, fault analysis, and diagnosis of various types of wires. Goddard is providing technical expertise to assist Goodrich with its work. Goodrich's advances not only will enhance the safety of aircraft but also can be applied to wire inspection, fault analysis, and diagnostics for the Exploration Systems and Aeronautics Research Mission Directorates. ■

Event	Technologies/Topics	Outcome
Transportation Research Board Annual Meeting	NASA's research on electromagnetic launch assist (EMLA)	• Explored partnership opportunities • Promoted June EMLA workshop
Technology Transfer in the Mid-Atlantic: Capitalizing on Opportunities in 2005	Spin-in/Spin-out	• Explored opportunities for partnerships within the Mid-Atlantic and Greater Washington regions
National Design and Engineering Show 2005	Conformal Robotic Gripper Dead-End Welding Device Gear Bearings Hilbert Huang Transform Miniature Probe/Pump Micron & Submicron Pointed Structures	• Company interest in prototype licenses for gear bearings • Company interest in probe/pump • Company interest in Goddard software

New technologies reported: 26

New technologies were reported by the following civil servants, contractors, and universities.

Civil Servants

Code 500

Alan Cudmore: Board Support Package for the RTEMS Real-Time Operating System on the Motorola MCF5307C3 Processor Board

Bruce Dean: Alignment Insensitive Active Center-of-Curvature Wavefront Sensing and Control Telescope Architecture

Lee Feinberg: Alignment Insensitive Active Center-of-Curvature Wavefront Sensing and Control Telescope Architecture

Yury Flom: Method of Construction of Truss Structures in Space

John Hagopian: Alignment Insensitive Active Center-of-Curvature Wavefront Sensing and Control Telescope Architecture

Brian Harris: Use of Strain Gages to Detect Bonded Joint Failures of Integrated Science Instrument Module (ISIM) at Cryogenic Temperatures

Joe Howard: Alignment Insensitive Active Center-of-Curvature Wavefront Sensing and Control Telescope Architecture

Michael Kraniak: Method for Improved Geiger-Mode Photon Counting with Avalanche Photodiodes by Reducing After-Pulsing

Douglas Leviton: Light Direction Sensor

Timothy Ray: CCSDS File Delivery Protocol (CFDP) Software Library

David Robinson: Aluminum Substrates for Zeolite Molecular Absorbers

John Vranish: Modular Gear Bearings

Code 600

Samuel Floyd: Automated Spectroscopy of X-Ray Fluorescence Spectra

Timothy McClanahan: Automated Spectroscopy of X-Ray Fluorescence Spectra

James Tilton: Split-Remerge Method for Eliminating Processing Window Artifacts in Recursive Hierarchical Segmentation (HSEG); Innovative Utilization of the Heap Data Structure for Efficient Determination of Best Merges for HSEG

Jacob Trombka: Automated Spectroscopy of X-Ray Fluorescence Spectra

Contractors

Accurate Automation Corporation

Advanced Technology Management

Orville Fleming

Rust Design

Science Systems and Applications

Sigma Space Corporation

Swales Aerospace

Universities

Northwestern University

University of Kentucky

University of Maryland–Baltimore County

University of Washington

Worcester Polytechnic Institute

Software Release: 3

Innovators receive a $500 to $1,000 award for software approved for public release.

- General EQFlux, **Edward Gaddy** (Code 563)
- Integrated Structural Analysis and Test Program, **Daniel Kaufman** (Code 542)
- Shuttle InfraRed Image Analysis Software (SIRIAS), **Donald Jennings** (Code 693), **Brian Ottens** (Code 553), and **Bradford Parker** (Code 541)

Issued Patents: 3

Innovators receive a $500 to $1,000 award for an issued patent.

- U.S. Patent #6,844,856: Minimum Cycle Slip Airborne Differential Carrier Phase GPS Antenna, **Charles Wright** (Code 614)
- U.S. Patent #6,862,558: Empirical Mode Decomposition for Analyzing Acoustical Signals, **Norden Huang** (Code 614)
- U.S. Patent #6,847,354: 3-D Interactive Display, **John Vranish** (Code 544)

Patent Applications Filed: 2

- Phase-Oriented Gears, **John Vranish** (Code 544)
- Real-Time Parylene-Thickness Monitoring Optical Sensor System, **Michael Beamesderfer** (Code 541)

Provisional Patents Filed: 4

- Conformal Gripper, **John Vranish** (Code 544)
- Hardware and Technique for Dead-End Welding of All Types of Tubing, **Michael Wilks** (Code 597)
- Shuttle InfraRed Image Analysis Software (SIRIAS), **Brian Ottens** (Code 556), **Bradford Parker** (Code 541), and **Donald Jennings** (Code 693)
- Template for Deposition of Micron and Submicron Pointed Structures, **Diane Pugel** (Code 553) ■

Two Space Act Board Awards Issued

NASA's Invention and Contributions Board recognized the following innovations with a Space Act Board Award:

- Gear Bearings by **John Vranish** (Code 544)
- Micro Pulse Lidar by **James Spinhirne** (Code 613)

These awards, which can reach a maximum of $100,000, are bestowed for technologies with significant scientific and technical contributions. To be eligible, innovations must have been reported through a New Technology Report (NTR), which can be accessed through the online eNTRe system (http://entre.nasa.gov). Once an NTR has been filed, OTT can help innovators prepare the Space Act Award application (Form 1329).

For more information, see the Awards section of OTT's Web site (http://techtransfer.gsfc.nasa.gov/awards-info.html). ■

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